REMARKS

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 1 and 8-17 are currently pending, with Claims 1 and 17 being independent. Claims 11-12 are withdrawn from consideration.

Office Action Summary

Claims 1, 8, and 9 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,041,617 to Sanada et al. (hereinafter "Sanada"); Claim 10 was rejected under 35 U.S.C. § 103(a) as unpatentable over Sanada; Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sanada in view of U.S. Patent No. 4,786,301 to Rhodes (hereinafter "Rhodes 301"); Claims 15 and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sanada in view of U.S. Patent No. 4,995,235 to Halene (hereinafter "Halene");

Claims 1, 8-10, and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,700,550 to Rhodes (hereinafter "Rhodes 550") in view of U.S. Patent No. 5,005,371 to Yonezawa et al. (hereinafter "Yonezawa"); Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rhodes 550 in view of Yonezawa, further in view of Rhodes 301; and Claims 15 and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rhodes 550 in view of Yonezawa, further in view of Halene.

Rejection of Claims 1, 8, and 9 under 35 U.S.C. § 102(b) over Sanada

Applicants respectfully traverse the rejection of Claims 1, 8, and 9, and submit that Sanada fails to teach or suggest all features recited in Claim 1.

Briefly summarizing, Claim 1 recites

> an air conditioning apparatus, comprising:

> a cold and hot water circuit for the flow of cold and hot water, the cold and hot water circuit including
>
> **four heat exchangers for effecting heat exchange between the cold and hot water and an airstream**, wherein two of the four heat exchangers are made up of **air heat exchangers which mainly perform air sensible heat processing** and the other two heat exchangers are made up of **adsorption heat exchangers which mainly perform air latent heat processing** with an adsorbent supported on a surface thereof,
>
> a first switching mechanism for switching a direction of cold and hot water flow so that hot water flows through one of the adsorption heat exchangers while cold water flows through the other adsorption heat exchanger, and
>
> a second switching mechanism for switching the direction of cold and hot water flow so that hot water flows through one of the air heat exchangers while cold water flows through the other air heat exchanger.

As emphasized above, Claim 1 recites four heat exchangers ... effecting heat exchange between cold and hot water and ***an airstream***. Two of the four heat exchangers are air heat exchangers which mainly perform air sensible heat processing, and the other two heat exchangers are adsorption heat exchangers which mainly perform air latent heat processing and have an adsorbent supported on a surface.

The Office Action asserts that Sanada teaches all features recited in Claim 1. Applicants respectfully disagree, because Sanada fails to teach or suggest four heat exchangers as recited in Claim 1. Specifically, Sanada lacks two air heat exchangers which mainly perform air sensible heat processing and two adsorption heat exchangers which mainly perform air latent heat processing. The Office Action asserts that elements 1, 2, 7, and 9 (illustrated for example in Fig. 8 of Sanada) correspond to four heat exchangers as recited in Claim 1. Specifically, the Office Action asserts that adsorbent heat exchangers 1 and 2 correspond to the two adsorption heat exchangers which mainly perform air latent heat processing. However, Sanada states that "adsorbent heat exchangers 1 and 2 are **housed in a vacuum housing 33** and isolated from each other by a partitioning wall 34 [emphasis added]." (Sanada, column 2, lines 4-6.) Thus,

adsorbent heat exchangers 1 and 2 are not in contact with air (because they are in a vacuum housing), and thus cannot perform any heat exchange *with an **airstream***, as is required by Claim 1.

Further, Sanada describes that adsorbent heat exchangers 1 and 2 are used to effect heat exchange between water and alcohol based coolant. (Sanada, column 2, lines 53-62; column 17, lines 25-33.) Indeed, it is this coolant, which subsequent to being processed in vacuum cylinder 33, effects heat exchange with an airstream through air cooler 68. (Sanada, Figs. 15-17; column 17, lines 33-44.) Thus, at best Sanada describes heat exchange between coolant and air, but not between water and air. Accordingly, Sanada fails to teach or suggest at least two adsorption heat exchangers which mainly perform air latent heat processing, as recited in Claim 1.

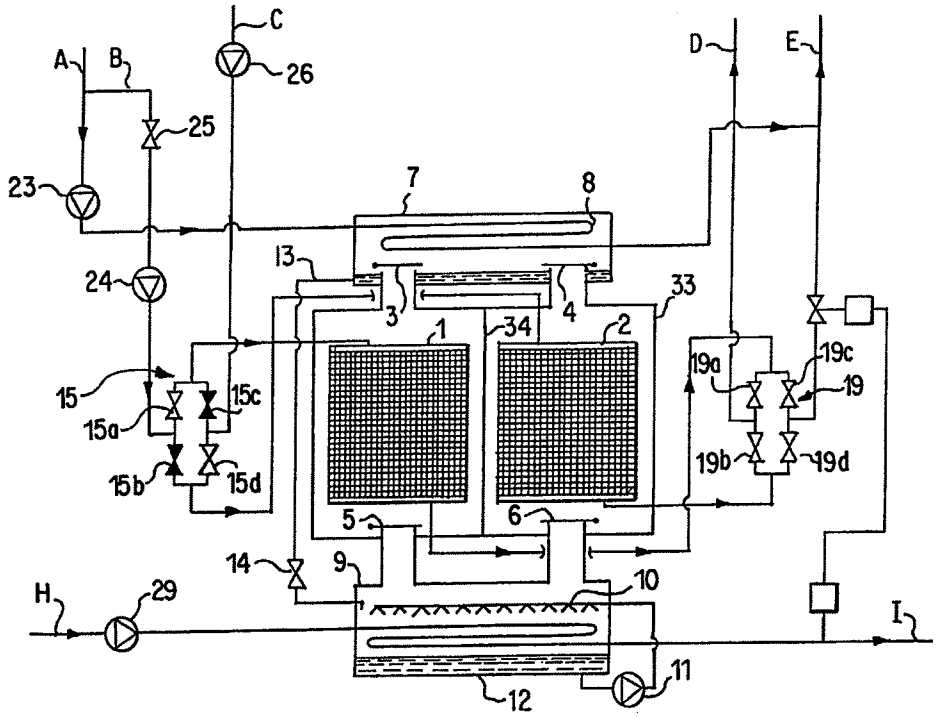

FIG.8

In addition, condenser 7 and evaporator 9 (illustrated in Fig. 8 of Sanada, reproduced above) are not two air heat exchangers which mainly perform air sensible heat processing. Specifically,

condenser 7 and evaporator 9 at best effect heat exchange between coolant and water, but not between water and an airstream. (See Sanada, column 1, lines 51-56.) This is also evident from the arrangement of Fig. 8 which shows that condenser 7 and evaporator 9 are connected to the vacuum housing 33 through suction valves 3-6. Thus, no air can enter that closed system of condenser 7 and evaporator 9 of Sanada, contrary to the assertions in the Office Action.

Furthermore, the only heat exchange with air described by Sanada takes place in air cooler 68, which is cooled by alcohol based coolant, rather than by water. Sanada explicitly states that coolant (rather than air) flows through condenser 7 and evaporator 9 (which is a part of coolant tank 12). (See Sanada, column 17, lines 1-6, 20-24.) Therefore, there is no reason for elements 1, 2, 7, and 9 of Sanada to perform heat exchange with an air stream, as Sanada specifically describes heat exchange between air cooler 68 and an airstream.

Accordingly, Applicants respectfully submit that Claim 1 (and all associated dependent claims) patentably defines over Sanada, and request that the rejection of Claims 1, 8, and 9 under 35 U.S.C. § 102(b) be withdrawn.

Rejections of Claims 10 and 13-16 under 35 U.S.C. § 103(a)

Applicants respectfully traverse the rejections of Claims 10 and 13-16 under 35 U.S.C. § 103(a) over Sanada as the primary reference. Applicants respectfully submit that the secondary references combined by Sanada to reject Claims 10 and 13-16 fail to cure the deficiencies of Sanada with respect to Claim 1 noted above. Accordingly, Applicants respectfully request that the rejections of Claims 10 and 13-16 under 35 U.S.C. § 103(a) over Sanada as the primary reference be withdrawn.

Rejection of Claims 1, 8-10, and 17 under 35 U.S.C. § 103(a)

Applicants respectfully traverse the rejection of Claims 1, 8-10, and 17 under 35 U.S.C. § 103(a) over Rhodes 550 in view of Yonezawa, and submit that no proper combination of the references teaches or suggests all features recited in independent Claims 1 and 17. Further, the proposed combination of the references is improper, as it would render the primary reference inoperable or unsuitable for its intended purpose.

Rhodes 550 describes a desiccant air conditioning system including conventional heat exchangers (82, 84) and heat exchanging desiccant beds (12, 14). (Rhodes 550, Fig. 9.) However, as conceded by the Office Action, Rhodes 550 is silent regarding the use of hot and cold water loops and instead uses a compression-expansion refrigerant system. The Office Action attempted to cure this acknowledged deficiency by applying Yonezawa.

Yonezawa describes an adsorption thermal storage apparatus for storing thermal energy. This apparatus also uses a compression-expansion refrigerant system to cool or to heat water. Several embodiments of the thermal storage apparatus are illustrated in Figs. 1(a-d). The thermal storage apparatus is formed as a cylindrical vessel 1 internally maintained in vacuum and sealed with a refrigerant. (Column 5, lines 11-14.) The apparatus includes "cooling section a" and "evaporation section b." Cooling section a has adsorbent material 4 on its surface. Further, Yonezawa describes supplying hot water or cold water, as a result of performing a compression refrigeration cycle. (Yonezawa, column 7, lines 18-20; column 8, lines 64-68; column 10, lines 24-25.) In other words, the heat exchange in Yonezawa is between refrigerant and water, rather than between water and an airstream, as required by Claim 1.

The Office Action apparently attempts to combine the hot and cold water system of Yonezawa with the system of Rhodes 550 to allegedly render obvious the features recited in

independent Claims 1 and 17. In other words, it appears that the Office Action alleges that it would be obvious to replace the compressor, accumulator, oil trap, dryer etc. of Rhodes 550 with all the water pipes described in Yonezawa, and run water, rather than refrigerant through the system.

Even if such a combination were attempted, the combination fails to teach or suggest four heat exchangers for effecting heat exchange between the cold and hot **water** and an **airstream**. Rhodes 550 describes heat exchange between refrigerant and air, while Yonezawa describes heat exchange between refrigerant and air, and between refrigerant and water. Thus, neither of the references teaches or suggests heat exchange **between water and an airstream**, as is required by Claims 1 and 17. Therefore, no proper combination of Rhodes 550 and Yonezawa teaches or suggests all features recited in Claims 1 and 17. Accordingly, Claim 1 and 17 (and all associated dependent claims) patentably define over any proper combination of Rhodes 550 and Yonezawa.

Furthermore, the combination proposed by the Office Action is improper and would render the proposed combination inoperable and unsuitable for its intended use. A compression - expansion refrigerant based system is fundamentally different from one based on hot and cold water. It would not obvious to replace all pipes designed for compressed refrigerant (as described by Rhodes 550) with pipes designed for water (as described by Yonezawa), because Yonezawa also describes a pipes described for compressed refrigerant, and only uses the compressed refrigerant to heat or cool the water.

In addition, such a combination would render the system of Rhodes 550 inoperable if water were used in the existing pipes designed for refrigerant. The Office Action has provided no reason why a person skilled in the art would attempt such a combination, much less why such a combination would actually work. No reason has been given why the compression - expansion

refrigerant system of Rhodes 550 would be replaced, especially if it performs its intended purpose properly.

Further, Yonezawa also describes a compression-expansion refrigerant system based on circulating refrigerant. The Office Action provided no reason why only the water circuit (instead of the compressed refrigerant circuit also described by Yonezawa) would be added to Rhodes 550. Indeed, the only reason appears to be a hindsight reconstruction based on Applicants' own disclosure.

Finally, Yonezawa is not analogous to Rhodes 550. As Applicants explained in the Reply of January 15, 2010, "cooling section a" and "evaporation section b" described by Yonezawa are not adsorption heat exchangers which mainly perform air latent heat processing and further do not effect heat exchange with an airstream, because section a and section b are not in contact with air. (Yonezawa, column 5, lines 11-41.) Instead, Yonezawa is concerned with storing thermal energy using the adsorbent material, and to use the stored thermal energy to level electric power consumption. (Yonezawa, column 9, lines 39-41.) Thus, it is not clear how, and which, particular water pipes of Yonezawa would be used in the system of Rhodes 550, because Yonezawa does not include analogous heat exchangers as those described in Rhodes 550. Indeed, the Office Action failed to identify any particular water pipes of Yonezawa which would be added to Rhodes 550.

Accordingly, Applicants respectfully submit that a *prima facie* case of obviousness with regard to Claims 1 and 17 (and all associated dependent claims) has not been presented, and request that the rejection of Claims 1, 8-10, and 17 under 35 U.S.C. § 103(a) over Rhodes 550 in view of Yonezawa be withdrawn.

Rejection of Claims 13-16 under 35 U.S.C. § 103(a)

Applicants respectfully traverse the rejections of Claims 13-16 under 35 U.S.C. § 103(a) over Rhodes 550 in view of Yonezawa and further modified by additional secondary references. As noted above, the combination of Rhodes 550 in view of Yonezawa is improper, and it fails to teach or suggest all features recited in independent Claims 1 and 17. Applicants respectfully submit that the additional secondary references fail to cure the deficiencies of Rhodes 550 and Yonezawa, and request that the rejections of Claims 13-16 under 35 U.S.C. § 103(a) over Rhodes 550 in view of Yonezawa and further modified by additional secondary references be withdrawn.

Conclusion

In view of the foregoing remarks, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact George S. Dolina, Registration No. 63654 at the telephone number of the undersigned below to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Director is hereby authorized in this, concurrent, and future replies to charge any fees required during the pendency of the above-identified application or credit any overpayment to Deposit Account No. 02-2448.

Dated: July 8, 2010

Respectfully submitted,

By

D. Richard Anderson
Registration No.: 40439
BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road, Suite 100 East
P.O. Box 747
Falls Church, VA 22040-0747
703-205-8000